



Memorandum

Date: September 9, 2005

To: Watershed Plan Development Committee & Interested Parties

From: Jones & Stokes, San Francisco Estuary Institute

Subject: **Framing the Watershed Plan (Revised)**

Please note: The following memorandum has been revised based on discussion and feedback received during the Bay Area Watershed Plan workshops, held on July 14th and July 26th, 2005. Please see the project's web portal (www.bayareawatershedplan.net) for additional project and workshop updates.

I. Introduction and Purpose

The purpose of this memorandum is to describe the work completed to date in framing the Bay Area Watershed Plan. We begin (Section I) with a definition of key concepts (watersheds and multi-benefit projects), followed by objectives of the Watershed Plan itself. Section II describes the Planning Framework, vetted during the two Watershed Plan Development Committee meetings in July 2005. Section III identifies the key watershed management issues from the regional plan review, as well as the project Vision, Principles, Goals, and Objectives. Section IV describes project assessment questions that will contribute to project understanding and evaluation. Section V identifies next steps in development of the Watershed Plan.

A. What is a Watershed?

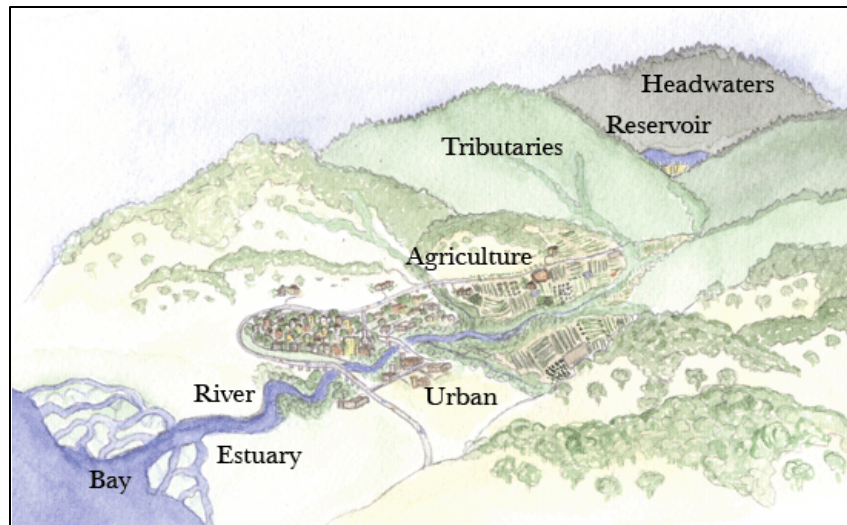
To begin thinking collectively about watershed management, protection, and restoration, it is important to develop a clear understanding of our unit of analysis: the watershed. Following are two definitions that help us to understand the importance of hydrology, ecology, and human development within a watershed.

A watershed is...“an area of land that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel.”

- Dunne and Leopold, 1978

A watershed is..."that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of the community."

- John Wesley Powell, scientist & geographer



Source: Watershed Information Center and Conservancy (WICC) of Napa County, Jenny MacIlvaine

B. What is a Multiple Benefit Water Project?

A key concept in the Watershed Plan is support of multiple benefit water projects. Multiple benefit water projects would support several different functions within a watershed. For example, one river enhancement project could serve several objectives:

- ✍ Stream, floodplain, and/or marsh restoration;
- ✍ Flood hazard reduction and management;
- ✍ Groundwater recharge;
- ✍ Wetlands creation or enhancement; and
- ✍ Sediment storage or erosion control.

These functions and values are all important objectives in watershed management, protection, and restoration undertaken by Bay Area agencies and organizations. Identification of synergies between multiple benefit projects will be a key component of the Watershed Plan.

C. What is the Bay Area Watershed Plan?

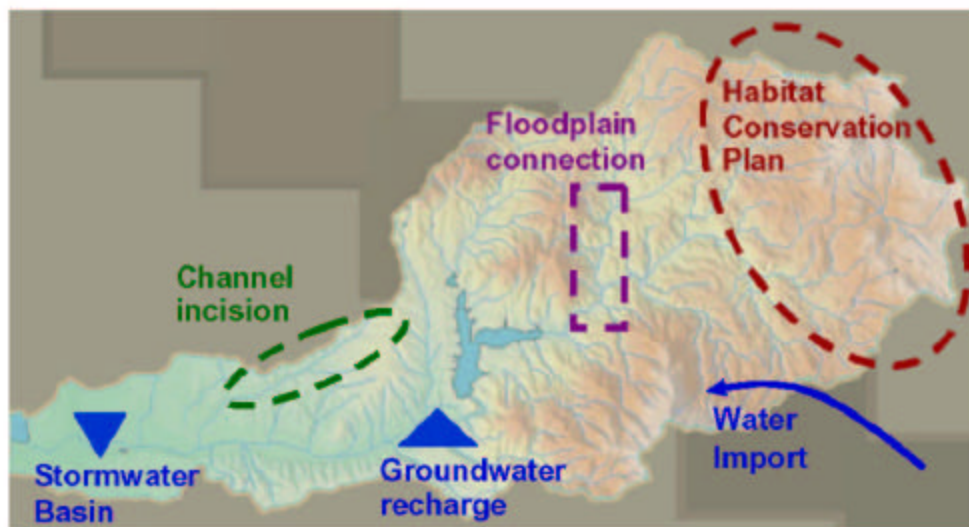
The State Coastal Conservancy (Conservancy) is leading the preparation of the Bay Area Watershed Plan. Building upon historical planning efforts (such as the Baylands Habitat Goals Project) and aligning with current efforts (such as the Uplands Habitat Goals Project), the Watershed Plan will continue to build upon the existing ecological foundation for sustainable watershed management in the San Francisco Bay Region.

Objectives of the Watershed Plan

The Conservancy has defined three objectives for the Watershed Plan:

1. A stand-alone document that will address regional watershed management, habitat protection, and restoration issues, for use by multiple entities.
2. A tool for evaluating watershed and habitat restoration projects funded by the Conservancy and others.
3. An integral component of the Bay Area Integrated Regional Water Management Plan (IRWMP).

The Watershed Plan will summarize different types of watershed management, habitat conservation, and restoration projects being planned and implemented throughout the region. On this foundation, additional water resources projects (including water supply, stormwater management, and water conservation projects) will be considered to identify positive synergies between the various projects. Such positive synergies in a hypothetical watershed setting are illustrated below.



nes & Stokes, July 2005.

The Watershed Plan will identify project evaluation criteria with respect to watershed and habitat objectives, and serve as part of an integrated blueprint for caring for our Bay watersheds while meeting water supply needs. In the short-term, the Watershed Plan will provide a framework for evaluating projects that qualify for funding under Proposition 50, Chapter 8 (Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002).

The Watershed Plan will provide a discussion of key issues related to watershed management, habitat protection, and restoration within the Bay Area. The Plan will also provide a working list of potential projects and future measures that address these key issues. A key component of the Plan is a regional database and mapping function that will be available via the web portal (www.bayareawatershedplan.net).

II. Setting the Planning Framework

Prior to developing the Watershed Plan, fundamental questions must be answered to frame the content of the Plan. The Planning Framework establishes the boundaries of the Watershed Plan, and determines whether certain activities and programs are considered projects or not. Please see the *Bay Area Watershed Plan Framework* graphic.

A. Definition of a Project

What is a “Project” and what kinds of projects will be considered in the Watershed Plan?

A project is a planned activity with an allocated budget to benefit watershed health. Projects should have a measurable benefit to freshwater and/or tidal ecosystems. Minimum project size will depend on project type.

We suggest that there are several types of projects to be addressed by the Watershed Plan:

- ✍ *Conservation Planning and Acquisition Projects* protect and conserve sensitive lands with important habitat areas. Such projects can include design, planning, or acquisition phases of the project.
 - *Example:* South Bay Salt Pond Restoration Project - Planning and acquisition of salt ponds for mudflat and tidal marsh restoration.
 - *Example:* Habitat Conservation Plan (HCP) projects around Bay have placed several thousands of acres of land into conservation.
- ✍ *Capital Projects* materially change the face of the land. Projects may include restoration, and enhancement activities. Such projects can include design, planning, or acquisition phases of the project.

- *Example:* Martinez Shoreline Wetlands – Provides tidal marsh habitat and flood control benefits.
- *Example:* San Francisquito Creek, Guadalupe Creek, Napa River, etc – Stream restoration projects providing channel stabilization, revegetation of riparian habitat, reconnection to the floodplain, and infiltration to the groundwater basin.
- *Example:* Alameda Creek DUST (Demonstration of Urban Stormwater Treatment) Marsh – Collection and treatment stormwater runoff via wetlands.
- ✍ *Operations and Maintenance Projects* maintain the face of the land including a variety of maintenance, retrofit, and repair activities such as dredging a creek, removing biological invasions, or replacing culverts that are causing erosion. Such projects can include design, planning, and operations phases of the project.
 - *Example:* Zone 7 Stream Management Master Plan – Manages flood flows, water quality, and habitat in streams and arroyos of the Livermore-Amador Valley.
 - *Example:* Santa Clara Valley Water District Stream Channel Maintenance Program – Includes habitat mitigation and impact reduction approaches to channel maintenance for flood control, etc.
- ✍ *Education, Outreach, and Stewardship Projects* garner public support and stewardship for community water resources.
 - *Example:* State Coastal Conservancy's Environmental Restoration and Education Awards – Nonprofit organizations are awarded funds for habitat restoration projects undertaken by students in grades K-12.
- ✍ *Regional Assessment and Monitoring Projects* support adaptive management of sensitive resources through collection and analysis of watershed data, as well as monitoring of watershed conditions and implemented projects.
 - *Example:* National River Restoration Science Synthesis (NRRSS) database of river restoration projects.
- ✍ *Policy Projects* provide research, analysis, and policy development for local jurisdictions, regional bodies, and State and federal agencies for protection of water bodies and watershed health.
 - *Example:* Development of a model Creek Setback Ordinance, for use by Bay Area communities to protect riparian corridors.
 - *Example:* Development of a model Watershed Element for a local city or county General Plan Update.

B. Geographic Boundaries

What are the geographic boundaries of the Watershed Plan?

For analysis of watershed protection and restoration projects seeking funding from the Conservancy and/or other sources, we suggest addressing all lands within the nine-county Bay Area. This boundary is consistent with the San Francisco Bay Area Conservancy Program.

For analysis of watershed projects eligible for funding under Proposition 50, we suggest focusing efforts on watersheds in the nine-county Bay Area draining into San Francisco, San Pablo, and Suisun Bays. In its strictest sense, this will exclude both coastal and inland drainages in the outer portions of the region that do not drain to the Bay. This boundary is an adaptation of the San Francisco Bay Regional Water Quality Control Board (Region 2) boundary to exclude Pacific coastal drainages. The Watershed Plan will include a map illustrating the boundaries of the Bay Area IRWMP, as well as other IRWMP efforts being prepared in the region (i.e., North Coast IRWMP, East Contra Costa County IRWMP, Pajaro River IRWMP).

C. Scale of Analysis

Scale of analysis is important in several aspects of the Watershed Plan, but initially it needs to be considered in terms of: (A) organizing data across the entire Bay region according to the project goals; and (B) determining which data are used to identify/prioritize specific projects.

(A) What scale should be used to organize and/or present watershed data?

Watershed data will be used to support the identification of needs, opportunities, and potential projects that will address the watershed management goals and objectives. Watershed data will be in the form of Geographic Information Systems (GIS) layers, available for query on the web portal (www.bayareawatershedplan.net).

We suggest that the data collection effort for the Watershed Plan be Bay-wide at the regional and/or watershed scale – that is, available data sources that will inform analysis of the watershed management goals and objectives.

Example: Goal: Protect and Enhance Wildlife Habitat

Objective: Protect and Recover Fisheries

Issue: Fish passage barriers

*Regional Data Needed: Location of streams, Historic extent of fish in streams,
Location of problematic barriers to known fish corridors?*

From this proceed to (B)...

(B) What scale should be used to evaluate and prioritize watershed projects?

We suggest evaluating and prioritizing projects based on their ability to address the watershed management goals and objectives in specific watershed settings. Based on the analysis of regional watershed data presented in (A), we would then go deeper to assess which watersheds provide the best opportunities for improvement? And then, which (or what kinds) of projects within those watersheds will help?

Project proponents will be asked to provide site and reach information used to understand how the project would improve watershed health. Projects will be evaluated by benefits provided within their reach, and also by synergies provided between neighboring projects across the watershed.

III. Identifying the Watershed Plan Goals

Various management plans have been developed for streams and watersheds throughout the Bay Area by regulatory agencies, water supply and flood control districts, park districts, non-profit organizations, and active community groups (or ‘Friends’ groups). The Watershed Plan intends to build on existing watershed and resource management planning that has been conducted throughout the region, and not reinvent the wheel.

The following sections describe the regional plan review conducted to provide a basis for discussion of watershed management goals and objectives, as well as the Project Vision, Principles, Goals, and Objectives developed by the Watershed Plan Development Committee.

A. Regional Plan Review

Jones & Stokes reviewed and cataloged a sample of nearly 40 planning documents from around the San Francisco Bay Area. Review of these planning documents was intended to provide an overview of the management goals and objectives used by Bay Area resource managers to protect sensitive habitats. Although this is not an exhaustive list of watershed and habitat planning documents in the region, it provides a solid beginning for developing goals for the Bay Area Watershed Plan. Documents were selected based upon accessibility – those identified by then-current Plan Development Committee members, provided in hard copy, and/or easily downloaded from the web.

Jones & Stokes reviewed the primary goals and objectives listed in each planning document in order to better understand what key topics are being addressed throughout the region. Table 1 provides a summary of the goal and objectives identified in the regional plan review. These are high-level goals statements, and do not include nested ideas within specific management actions.

Table 1. Goals and Priorities from Watershed Planning Documents			
<i>Goals and Objectives Statements</i>		<i>Number of Plans</i>	<i>Percent of Plans</i>
1	Protect & Enhance Wildlife Habitat	32	82%
2	Protect & Improve Water Quality	23	59%
3	Provide Recreation, Trails & Access	22	56%
4	Protect & Restore Wetlands	21	54%
5	Protect & Restore Streams & Riparian Areas	21	54%
6	Increase Awareness & Education	19	49%
7	Prevent Erosion & Sedimentation	17	44%
8	Retain Agriculture / Improve Grazing Practices	14	36%
9	Enhance Wildlife Populations & Biodiversity	13	33%
10	Research & Scientific Understanding	12	31%
11	Flood Protection & Drainage	11	28%
12	Control Stormwater Pollution	10	26%
13	Protect & Recover Fisheries	10	26%
14	Partnerships & Coordination	10	26%
15	Coordinate with Land Use Planning	10	26%
16	Provide & Protect Water Supply	9	23%
17	Preserve Open Space & Wildlands	9	23%
18	Promote Involvement & Stewardship	9	23%
19	Pest / Invasive Species Management	9	23%
20	Reduce Fire Hazards	8	21%
21	Recover At-Risk Native Species	8	21%
22	Streamline Regulatory Process / Permitting	8	21%
23	Balance Costs & Benefits	8	21%
24	Protect Cultural & Archeological Sites	7	18%
25	Enhance Visual / Scenic Qualities	7	18%
26	Water Conservation & Reuse	6	15%
27	Respect Private Property Rights	6	15%
28	Monitoring & Evaluation	6	15%
29	Enable Wildlife Movement & Lifecycle	5	13%
30	Non-Regulatory Incentives	5	13%
31	Maintain In-Stream Flow Conditions	5	13%
32	Utilities, Transportation & Water-related Industry	4	10%
33	Dredging and Waterway Modification	4	10%
34	Technology / Information Resource	3	8%

The most commonly cited goals in Bay Area planning documents addressed wildlife habitats and/or populations. The goal identified most frequently in watershed planning documents (82%) was to protect and enhance wildlife habitat. Approximately 54% of watershed planning documents identified as priorities to protect and restore wetlands, and/or to protect and restore streams and riparian areas. Over 33% listed as key goals to enhance wildlife populations and biodiversity, while 26% sought to protect and recover fisheries.

Another set of commonly cited goals statements addressed water quality concerns. Nearly 60% of the planning documents identified as a goal to protect and improve water quality. A number of documents also sought to prevent erosion and sedimentation (44%), to retain agriculture and improve grazing practices (36%), and to control stormwater pollution (26%).

Finally, the reviewed planning documents also commonly identified human and community processes as important in watershed management. Approximately 56% of planning documents listed as key goals to provide recreation, trails, and access. Many of these documents also sought to increase awareness and education (49%), to increase research and scientific understanding (31%), to strengthen partnerships and coordination (26%), and to coordinate with land use planning (26%).

B. Watershed Plan Vision, Principles, Goals, and Objectives

This regional plan review helped the Watershed Plan Development Committee to understand the key watershed management issues being addressed in the Bay Area. The following Vision, Principles, Goals, and Objectives clarify the following.

- ✍ **Vision** describes the Watershed Plan's purpose as developed by the State Coastal Conservancy and partners.
- ✍ **Principles** guide development of the Watershed Plan.
- ✍ **Watershed Goals and Objectives** describe desired outcomes and specific aspects of healthy watersheds.

Vision: To create a blueprint to improve watershed health throughout the San Francisco Bay watershed, that builds upon and is complementary with past and current regional planning efforts.

The Watershed Plan will be a stand-alone document to guide regional watershed management, habitat protection, and restoration planning efforts by multiple entities. It will:

- ✍ Provide a tool for evaluating watershed and habitat restoration projects funded by the Conservancy and others, by providing relevant information for project evaluation, prioritization, and selection.

- ✍ Provide a web-based information and communications tool for Bay watersheds. The initial phase will consist of developing a regional database framework, providing a Bay-wide picture of priority efforts that promote protection and enhancement of watersheds and habitats.

The Plan may also serve as an integral component of the Bay Area Integrated Regional Water Management Plan (IRWMP). As such, it will recognize the importance of comprehensive water resource management (e.g., water supply and quality, storm water, flood protection, and waste water) in achieving ecological goals and objectives and will help decision-makers to identify projects with multiple benefits.

Principles

1. To provide a regional context for sub-regional and individual projects, and to ***identify synergies*** between projects within the region's watersheds and across the region.
2. To foster the ***long-term sustainability*** of watershed systems within the region. To strive for restoration of streams, tributaries, and the Bay in all watershed actions. To consider opportunities in all components of the hydrologic cycle.
3. To ***coordinate watershed activities with land use planning***. To identify linkages between land use actions and health of Bay Area waters. To help land use agencies and landowners improve decision-making through consideration of watershed health and sensitivity.
4. To ***conserve and enhance biological diversity*** within the watershed by promoting and incorporating the California Biodiversity Council's Watershed Principles (<http://ceres.ca.gov/biodiversity/Text/mou.html>), as applicable, into the Plan.
5. To ***increase public agency and non-governmental organization (NGO) coordination*** and to ***assure a stakeholder involvement process*** in the development of the Watershed Plan and future efforts.
6. To ***encourage creativity and innovation*** in watershed and restoration planning.
7. To recognize the importance of ***ongoing scientific programs*** (such as monitoring, data evaluation, and adaptive management) to measure the effectiveness of projects and improve land and habitat management measures..
8. To ***increase support*** for watershed management in Bay Area communities.

Watershed Goals & Objectives

1. Provide, protect and enhance watershed habitat for plants and wildlife.

- A. Acquire, protect and/or restore wetlands, streams, and riparian areas.
- B. Enhance wildlife populations and biodiversity (species richness).
- C. Provide lifecycle support (shelter, reproduction, feeding).
- D. Protect and recover fisheries (natural habitat and harvesting).
- E. Preserve open space and wildlands.
- F. Protect wildlife movement/wildlife corridors.
- G. Manage pests and invasive species.
- H. Recover at-risk native and special status species.
- I. Improve structural complexity (riparian and channel).

2. Protect and improve hydrologic function and water quality of all water bodies.

- A. Control erosion and manage sedimentation.
- B. Improve filtration of point and non-point source pollutants.
- C. Maintain or improve in-stream flow conditions.
- D. Improve flow conveyance and storage.
- E. Improve floodplain connectivity.
- F. Provide for groundwater recharge.
- G. Increase opportunities for recycled water use.
- H. Maintain health of upland vegetation, to reduce runoff quantity and improve runoff quality.

3. Improve the region's quality of life through restoration and enhancement of local watersheds.

- A. Provide trails and recreation opportunities (water contact).
- B. Protect cultural resources.
- C. Increase community outreach, education, and support for watershed health.

IV. Developing the Project Assessment Questions

The Project Assessment Questions consist of a hierarchical set of descriptive questions that are to be asked about every project. These questions define what data are needed to assess each project in the context of its watershed, and serve as a guide for data collection in the next phase of Watershed Plan development.

Given that watershed projects meet the initial guidelines outlined in the Planning Framework (above), the Project Assessment Questions help the Planning Team to obtain enough information about each project in order to make important decisions about funding priorities. Please see the *Bay Area Watershed Plan Framework* graphic.

The Project Assessment Questions provide the following information:

- ✍ *Level 1 Questions:* Determine if the project is addressing regionally significant issues;
- ✍ *Level 2 Questions:* Determine how the project functions hydrologically, geomorphically, and ecologically within its site and its watershed; and
- ✍ *Level 3 Questions:* Identify opportunities for mutual benefits across multiple IRWMP Functional Areas.

A. Level 1 Questions

1. Does the project address the key issues identified in the Watershed Plan?

Watersheds face fundamental issues such as flooding, erosion and sedimentation, loss of native biological diversity, and pollution. The Watershed Plan is intended to coordinate regional watershed protection and restoration activities. As such, projects that receive implementation funding through the Watershed Plan and IRWMP should address regionally significant management issues.

2. Does the project address the symptom or the cause of the problem?

Many projects are designed to treat the symptoms of a problem rather than its cause. For example, maintenance projects to repair eroded channel banks might not address the cause of the erosion, which may be far upstream from the project site. Consideration of projects should include an understanding of local watershed processes, and potential long-term solutions to key issues (i.e., projects addressing the cause of problems).

B. Level 2 Questions

1. Where is the project located?

Mapping and analyzing each project site relative to four main considerations will determine the types of data that are needed to place any given project in a landscape context.

(a) Where is the project geographically within the region?

Description of the project's geographic location within the region will help identify jurisdictional boundaries (e.g., city, county, etc).

(b) Where is the project located relative to physical processes within the watershed?

Description of the project's geomorphic location within its watershed (e.g., headwaters, floodplain, and/or tidal channel) will help establish the context for the project site in terms of physical processes and functions. Description of how the project functions hydrologically is key to understanding the beneficial uses of the site, particularly in relation to other water management strategies being implemented within the watershed. For example, a stormwater detention pond may also provide seasonal wetlands habitat and groundwater percolation, which is particularly important in a watershed with groundwater withdrawals. Hydrologic and/or geomorphic functions include water and sediment sources, stormwater and sediment conveyance, water and sediment storage compartments, water quality improvements, groundwater recharge, and erosion control and channel stability.

(c) Where is the project located relative to ecological processes and functions within the watershed?

Description of the project's location in terms of ecological processes, functions, and values relates directly to the goals of the Watershed Plan, namely how a project might protect, restore, or enhance the wildlife habitats. Description of ecological functions may include provision of aquatic and wildlife habitat, temperature regulation, food web support, and existence values.

(d) Where is the project located relative to cultural priorities?

Description of the project's location relative to cultural heritage considerations (e.g., archeological and sacred sites, agricultural reserves, key cultural landmarks, parklands, greenbelts, etc.) and development (e.g., industrial, residential, military, etc.) will provide the cultural context.

2. What are the expected off-site consequences of project implementation?

Capital and maintenance projects tend to alter patterns of water or sediment transport and storage. These alterations can extend upstream and downstream from project sites with substantial impacts (positive or negative) on existing and future conditions. Spatial data on flow gradient, runoff, and flow patterns can inform project selection in terms of benefits and risks.

C. Level 3 Questions

1. Does the project benefit multiple IRWMP Functional Areas? If so, which ones? If not, then can mutual benefits be achieved through project redesign or relocation?

The primary goal of the IRWMP is to maximize the existing and possible mutual benefits that various projects might provide to multiple IRWMP Functional Areas. Description of the multiple water strategies implemented by each project is essential to fulfilling this goal.

V. Future Steps

The Watershed Plan will comprise the following future steps:

- ✍ Finalizing the planning framework, watershed management issues, and project assessment questions (Current task)
- ✍ Collecting watershed data and populating the web portal's GIS database (Fall 2005)
- ✍ Developing the Watershed Plan document (Winter 2005)
- ✍ Integrating the Watershed Plan with other IRWMP Functional Areas (Spring 2006)

Please see the *Bay Area Watershed Plan Conceptual Model* graphic. Our current task is shown on the left ("Framing the Watershed Plan").

BAY AREA WATERSHED PLAN CONCEPTUAL MODEL

FRAMING THE WATERSHED PLAN

- Document Review
 - Key Issues
- Data Objectives
- Regional Scale
- Habitat Typologies

FILTER: DATA OBJECTIVES

COMPILING THE DATA

- Existing Data
- Data Selection
- Data Acquisition/Links
- Data Gap ID

FILTER: EVALUATION MATRIX

DEVELOPING THE PLAN

- Analysis of
Regional Watershed
Projects:**
- Identification
 - Evaluation
 - Prioritization

FILTER: PROP. 50 CONSISTENCY

Water
Supply

Recycled
Water

Storm
Water

Watershed
Plan

**INTEGRATED
REGIONAL WATER
MANAGEMENT PLAN
(IRWMP)**

Web Portal

<http://www.bayareawatershedplan.net>

- Communication
- Information Sharing

- Decision Support & Analysis

